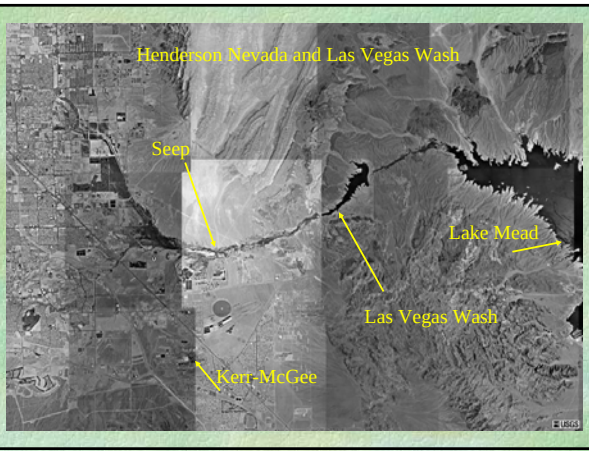
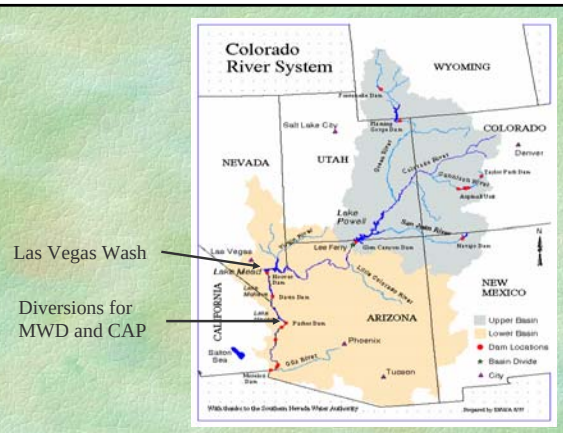
Perchlorate on the Lower Colorado River

William E. Werner
Arizona Department of Water Resources
April 15, 2005

Perchlorate - Background

- An oxidizer: supplies oxygen to chemical reactions
- Common uses: rocket fuel, explosives, road flares, ammunition, aircraft ejection seats.
- Health concerns: disrupts thyroid function which regulates growth and brain development.
- Occurrence: Contamination identified in 25 states (including AZ) – linked to improper waste disposal and leaks in manufacturing process.
- In 1997 MWD traced Perchlorate in Colorado River water to Las Vegas Wash – Kerr-McGee facility





California Aqueduct

Source: MWD

Source: CAP

Perchlorate Standards

- Federal Regulation – US EPA
  - Currently treated as unregulated contaminant (no enforceable Perchlorate standards)
  - 1995 established provisional reference dose (4-18 ppb)
  - Health risk assessment under review by National Academy of Sciences
  - Enforceable standards under the Safe Drinking Water Act in 2007?

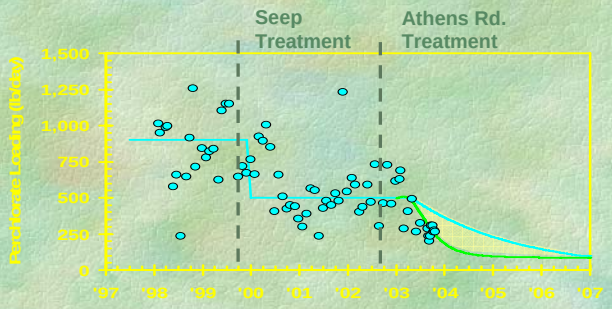
Perchlorate Standards

- California Regulation – CAL EPA
  - 2003 Public Health Goal (2-6 ppb)
  - Drinking water standard expected in 2004
- Arizona Regulation – ADHS / ADEQ
  - Health Based Guidance Level (14 ppb) – lowered from 31.5 ppb in May 2000

Kerr-McGee Remediation Efforts

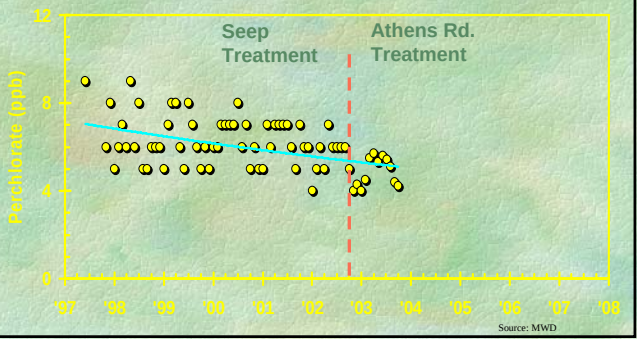
- 1997 – Perchlorate contamination in Colorado River traced to Las Vegas Wash and Kerr-McGee plant
- 1998 – Plume mapped and characterized
- 1999 – 2003 – Plume capture and treatment systems installed both on and off-site
  - Seep (spring) capture at Las Vegas Wash : surface water diversion and 9 extraction wells
  - Athens Rd. Well Field : 8 extraction wells midway between Kerr-McGee plant and Las Vegas Wash
  - Interceptor Slurry Wall : On-site 1,700' long x 60' deep barrier wall and 22 interceptor wells
- Constructing Biological Treatment (April 2004)

Perchlorate Loading -- Las Vegas Wash above Lake Mead



Source: Kerr McGee through CAP

Perchlorate Concentration at Lake Havasu (MWD Intake)



Source: MWD